

MEMORANDUM

To: Bryan Healy, Village of Croton-on-Hudson Village Manager
CC: Dan O'Connor, Village Engineer; Linda Whitehead, Village Attorney
From: Nick Vamvas & Barbara B. Beall, PWS, LEED®AP
Date: December 1, 2021
Re: Hudson National Golf Club/Matrix Development, LLC – Solar Project - Engineering Review
Project #: 82050.00

The following are our comments on the applicant's latest submission. The following items were reviewed for conformance with the Village code, NYSDEC stormwater design requirements, and general engineering and natural resource protection best practices:

- Additional Environmental Materials, Solar Panel Array Installation at Hudson National Golf Club dated November 23, 2021,
- Site Plan Proposed Subdivision/Solar Array System prepared for Hudson National Golf Club dated April 22, 2019 revised November 22, 2021 sheet 1 of 7 sheets,
- Overall Map, Proposed Subdivision/Solar Array System prepared for Hudson National Golf Club dated January 22, 2020 revised November 22, 2021 sheet 2 of 7 sheets,
- Tree Plan, Solar Array System prepared for Hudson National Golf Club dated March 25, 2020 revised November 22, 2021 sheet 3 of 7 sheets,
- Tree Replanting Landscape Plan, Solar Array System prepared for Hudson National Golf Club dated March 25, 2020 revised November 22, 2021 sheet 4 of 7 sheets,
- Tree Schedule, Solar Array System prepared for Hudson National Golf Club dated February 25, 2020 sheet 5 of 7 sheets,
- Erosion Control Plan, Solar Array System prepared for Hudson National Golf Club dated July 2, 2020 revised November 22, 2021 sheet 6 of 7 sheets,
- Detail/Notes, Solar Array System prepared for Hudson National Golf Club dated July 2, 2020 revised November 9, 2021 sheet 7 of 7 sheets,
- Site Plan Proposed Drains Maintenance Area prepared for Hudson National Golf Club dated May 21, 2021 revised November 22, 2021 sheet 1 of 3 sheets,
- Proposed Gutter Prickly Pear Hill Rd. prepared for Hudson National Golf Club dated November 22, 2021 sheet 2 of 3 sheets,
- Storage Areas Proposed Drains Maintenance Area prepared for Hudson National Golf Club dated May 21, 2021 revised November 22, 2021 sheet 3 of 3 sheets,
- Tim Miller Associates, Inc. response to habitat assessment report dated November 22, 2021,
- Ralph G. Mastro Monaco, P.E., P.C. "Response to Chazen Memo of October 29, 2021", and
- Stormwater Pollution Protection Plan at Hudson National Golf Club dated February 9, 2021 revised November 18, 2021.

COMMENTS ON ADDITIONAL ENVIRONMENTAL MATERIALS

Below are comments on the various materials submitted as enumerated in the "Contents" section of the package.

1. Visual Analysis Tree Loss

- a. Three simulations are provided and are consistent with this office’s expectation of the visual effect of the proposed action.
2. Solar Array System – Croton Pt Beach Transects 1-20-21
 - a. A total of twelve transects are provided from neighboring parcels.
 - b. Transects indicate that views from neighboring parcels will be limited due to existing vegetation to remain as well as from existing topography (particularly for the homes west of the proposed arrays).
 - c. Parts of the array may be more visible in winter months. It is recommended that the proposed planting list incorporate native evergreens where possible.
3. 7-11 Solar Site Rev 5-5-20 Transects-Plan-Sects
 - a. Transects are provided from the beach at Croton Point Park. This location is over 2 miles away from the site. At this distance, the visibility of the arrays will be minimal.
4. 12-Solar Site Offsite-Sections-Photos-5-5-20
 - a. Transects are provided from Route 9 and from Half Moon Bay, south of the proposed arrays. These locations are over 1 mile away from the site. At this distance, the visibility of the arrays will be minimal.
5. Natural Heritage Letter – Prickly Pear Solar LLC
 - a. Any comments on this document will be provided separately under the comments on the Tim Miller Associates response to habitat assessment report.
6. Ground Screw – Ksf G 76x2100-3xm16
 - a. This is a commonly used support for the “racking” structures supporting the solar panels. Chazen takes no exception to the use of this ground screw, though the applicant will be required to submit final equipment specifications prior to issuance of the building permit.
7. Megapack Datasheet
 - a. Does inclusion of this specification indicate the applicant’s intent to provide energy storage as part of this application?
8. Decommissioning Plan – Prickly Pear Solar, LLC – 11-23-2021
 - a. If energy storage systems are installed in the future, the decommissioning plan should be modified to include discussion of the removal of energy storage devices. We suggest making this a condition of the approval.
 - b. Section 2.3 refers to removal of gravel access roads, but the proposed plans indicate the access roads will be grass. It is expected that this section could, therefore, be removed.
 - c. Section 2.5 should be modified to include cost of removing the energy storage systems and to remove the costs associated with the access paths.
9. Matrix Response – Chazen 11-22-21 Public Comment; 10-29-21 Eng Review
 - a. To the response about contacting the fire department, it appears the applicant has attempted to reach the fire department but has been unsuccessful. Perhaps the Village could send a correspondence? The fire department should have an opportunity to weigh in. This should be a condition of site plan approval.
 - b. The other responses by Matrix address the comments noted.
10. Matrix Response to TDE Nov 19th Energy Review Letter
 - a. This is addressed in #9, and Chazen has no further comments.
11. Operations and Maintenance Plan 11-23-2021
 - a. The submitted plan meets the zoning requirement in §230-48.1.G(2)(e).
12. Power Clerk Attachment – Appendix A (Standard Contract)
 - a. No comment.

13. Ps-M-A Deg15vc(li) En 2020 A Web

- a. The attached data indicates the applicant proposes to install a solar panel with anti-reflective coating in accordance with §230-48.1.G(3)(j). Chazen takes no exception to the use of this panel, though the applicant will be required to submit final equipment specifications prior to issuance of the building permit.

COMMENTS ON REVISED PLANS (both the 7-sheet set and the 3-sheet set)

The applicant has adequately addressed nearly all previous comments on the site plans. Should the Board be prepared to put this to a vote, it is recommended that response to the comments below be made conditions of any approval.

1. Please note that the tree count has been revised downward to a total of 555 trees to be removed.
2. We suggest adding the jute mats as a “permanent” stormwater device to be inspected annually and replaced as needed.
3. Please provide a detail of the temporary diversion paths.
4. It appears that a new 15” CMP culvert is proposed for the driveway to Lands N/F of Reilly. What is the intent with the existing drain inlet along this driveway?
5. It appears there is a typo in the label for the electrical distribution and inverter pad. It is assumed the height is 8” and not 8’. Please confirm. Detailed designs of the slabs shall be provided prior to issuance of a building permit.
6. The rain garden detail should be corrected to note that the 1,200 s.f. to be captured and treated is not all impervious. The plans indicate that roughly 400 s.f. of impervious drain to the rain garden, with the remainder presumed to be lawn or some other pervious surface. Per NYSDEC, the total allowable impervious inflow to rain gardens is 1,000 s.f. The detail should also be modified to comply with the soil mixture provided in the NYSDEC design manual. The average organic content should be 5%, not 20-30% as stated. Lastly, please indicate the daylight location of the overflow structure on the plan.
7. Rain garden maintenance should include weeding, mulching, pruning/trimming of plants, and replacement of plants as needed.
8. Soil tests to confirm feasibility of the rain garden design shall be performed and the results provided

COMMENTS ON TIM MILLER ASSOCIATES, INC. RESPONSE TO CHAZEN MEMO

1. No further comment.
2. No further comment.
3.
 - a. The response states “Therefore it can be concluded that the proposed clearing for the solar array does not result in a fragmentation of continuous wooded habitat but rather a relatively small expansion of an existing condition.” Reviewing Figure 2 in the Habitat Report it appears that there will be disruption of a large undisturbed woodland that could constitute fragmentation with this project. Please demonstrate the expansion of an existing condition by illustrating on aerial photographs, current forest cover versus open habitat coverage, and patch sizes of each, before and after the solar installation.
 - b. Are there bluebirds, bobolink, kestrels or other species currently present on the golf course, or is usage by these species speculative?
4. This section states that “open field habitat is rare in the county.” Please provide documentation to support this statement.
5. No further comment.

6. The Piping Plover comment was simply meant to convey that it is unnecessary to state there is no “critical habitat” for the Indiana Bat on this site because there is no “critical habitat” for the Indiana Bat anywhere in the state. That said, the applicant’s commitment to a time of year clearing restriction is a benefit to any bats that may be utilizing the site and is adequate mitigation to address the potential loss of habitat.
7.
 - a. No further comment.
 - b. No further comment.
 - c. See 3.a. above. Additional information should be provided to support the assertion that there is no fragmentation associated with the proposed action.

COMMENTS ON SWPPP

The applicant has adequately addressed nearly all previous comments on the SWPPP. Should the Board be prepared to put this to a vote, it is recommended that response to the comments below be made conditions of any approval.

1. NOI Question #4 should be corrected with the currently proposed area to be disturbed.
2. NOI Question #5 should be answered “no.”
3. NOI Table 1 – the total contributing impervious area should be corrected to be based only on the area of the equipment pads, not the total 1,200 s.f. area draining to the rain garden.

COMMENTS ON DRAINAGE COMPUTATIONS (included in “Response to Chazen Memo of October 29, 2021”)

The applicant has provided the drainage computations as previously requested. The methodology appears sound and consistent with NYSDEC design practices. However, the HydroCAD model doesn’t include the existing impervious surfaces found on and around the site. Runoff from impervious surfaces is greater than that of the meadows and woods cited in the computations. Inclusion of the impervious surfaces should increase the peak runoff flows slightly in both the existing and proposed conditions. However, it is expected the revised model would still indicate the proposed peak flows will be the same or lesser than the existing flows. Thus, the proposed use of the sediment basin to control peak flows, in addition to the use of level spreaders at key offsite discharge points, should be adequate mitigation of the proposed stormwater runoff. The applicant is asked to please correct this as a condition of approval because this may affect the volume of the basin and the diameter of the outlet orifices and downstream swales/culverts.

REQUIRED SWPPP COMPONENTS CHECKLIST (per NYSDEC GP 0-20-001, requirements are paraphrased for brevity)

1. ESC Component
 - a. Background info **included**
 - b. Site map **included**
 - c. Soils description **included in Stormwater Assessment memo, February 9, 2021**
 - d. Construction phasing and sequencing **included**
 - e. Minimum ESC practices **included**
 - f. Temp and perm stabilization plan **included**
 - g. ESC plan **included**
 - h. ESC details including sizing of temp sed basins and structural practices **included**
 - i. Maintenance inspection schedule **included**
 - j. Description of pollution control measures (litter, chemicals, debris) **included**
 - k. Description of industrial stormwater discharges – N/A

- ‡ ID of any elements not in conformance – N/A
- 2. Post-Construction SWM Practice Component
 - a. ID of all SWM practices
 - i. Dimensions **included**
 - ii. Material specs **included**
 - iii. Installation details **included**
 - b. Site map showing location and size **included**
 - c. Modeling analysis report **included**
 - d. Soil test results (test pits) **provide prior to final site plan approval**
 - e. Infiltration test results **provide prior to final site plan approval**
 - f. O&M plan including inspection and maintenance schedule and ID of responsible entity **included**
- 3. Enhanced Phosphorus Removal Standards (where required) - NA

VILLAGE CODE §196-6. STORMWATER POLLUTION PREVENTION PLANS

- A. No application for approval of a land development activity shall be reviewed until the appropriate approving authority has received a stormwater pollution prevention plan (SWPPP) prepared in accordance with the requirements of this article. **SWPPP has been submitted for review**
- B. All SWPPPs shall provide the following background information, erosion and sediment control, and stormwater management measures relating to stormwater quantity (some requirements are paraphrased for brevity):
 - (1) Background information **included**
 - (2) Site map/construction drawings including the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent offsite surface water(s); wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of off-site material, waste, borrow or equipment storage areas; and location(s) of the stormwater discharge(s). The site map shall be at a scale no smaller than one inch equals 50 feet. **included**
 - (3) Soils description. **included in Stormwater Assessment memo, February 9, 2021 and Drainage Computations memo, November 8, 2021**
 - (4) Phasing plan. Not more than two acres shall be disturbed at any one time unless otherwise approved. **included**
 - (5) Description of pollution control measures (litter, chemicals, debris). **included**
 - (6) Description of construction waste materials stored on site and description of controls/storage. **included**
 - (7) Temporary and permanent structural and vegetative measures for each phase. **included**
 - (8) A site map/construction drawing(s) specifying the location(s), size(s) and length(s) of each erosion and sediment control practice. **included**
 - (9) Dimensions, material specifications and installation details for all erosion and sediment control practices, including the siting and sizing of any temporary sediment basins. **included**
 - (10) Temporary practices that will be converted to permanent control measures. **included**
 - (11) Implementation schedule for staging temporary erosion and sediment control practices, including the timing of initial placement and duration that each practice will remain in place until the site is stabilized. **included**

- (12) Maintenance schedule to ensure continuous and effective operation of the erosion and sediment control practice. **included**
 - (13) Name(s) of the receiving water(s) and NYSDEC classification(s), if applicable. **included**
 - (14) Delineation of SWPPP implementation responsibilities for each part of the site. **included**
 - (15) Description of structural practices designed to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site to the degree attainable. **included**
 - (16) Any existing data that describes the stormwater runoff at the site. **included**
 - (17) An acknowledgement by the landowner granting to the Village and other agencies having jurisdiction the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. **included**
 - (18) Description of each postconstruction stormwater management practice, including but not limited to dimensions, material specifications, and installation details for each postconstruction stormwater management practice. **included**
 - (19) Site map/construction drawing(s) showing the specific location(s) and size(s) of each postconstruction stormwater management practice. **included**
 - (20) Hydrologic and hydraulic analysis for all structural components of the stormwater management system for the applicable design storms, as per the manual specified in § 196-8A(1) herein. **included**
 - (21) Comparison of post-development stormwater runoff conditions with pre-development conditions. **included**
 - (22) Maintenance schedule to ensure continuous and effective operation of each postconstruction stormwater management practice. **Included but requires modification prior to acceptance of final site plan**
- C. In addition to the information requirements of § 196-6B, SWPPPs for land development activities disturbing one or more acres, whether or not these land development activities involve discharging a pollutant of concern to either an impaired water identified on the Department's 303(d) list of impaired waters or a total maximum daily load (TMDL) designated watershed for which pollutants in stormwater have been identified as a source of the impairment, must provide the following water quality controls (post- construction stormwater controls):
- (1) Description of each postconstruction stormwater management quality practice. **included**
 - (2) Site map/construction drawing(s) showing the specific location(s) and size(s) of each postconstruction stormwater management quality practice. **included**
 - (3) Hydrologic and hydraulic analysis for all structural components of the stormwater management quality system for the applicable design storms, as per the manual specified in § 196-8A(1) herein. **included**
 - (4) Dimensions, material specifications and installation details for each postconstruction stormwater management quality practice. **included**
 - (5) Maintenance schedule to ensure continuous and effective operation of each postconstruction stormwater management quality practice. **included**
 - (6) Maintenance easement(s), where required, to ensure access to all stormwater management practices at the site for the purpose of inspection and repair. Easements shall be recorded and shall remain in effect with transfer of title to the property. N/A
 - (7) Inspection and maintenance agreement recorded and binding on all subsequent landowners served by the on-site stormwater management measures in accordance with § 196-9 of this article. **included**